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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

WAYMO LLC,

Plaintiff,

v.

UBER TECHNOLOGIES, INC.,
OTTOMOTTO LLC; OTTO TRUCKING LLC,

Defendants.

Case No. 3:17-cv-00939-WHA

DECLARATION OF JAMES HASLIM IN SUPPORT OF DEFENDANTS' MOTION FOR SUMMARY JUDGMENT OF NON INFRINGEMENT

Date: June 8, 2017
Time: 8:00 a.m.
Ctrm: 8, 19th Floor
Judge: The Honorable William Alsup

Trial Date: October 2, 2017

REDACTED VERSION OF DOCUMENT SUBMITTED UNDER SEAL

I, James Haslim, declare as follows:

1. I am a Senior Manager, Engineering for the Advanced Technologies Group at Uber Technologies, Inc. ("Uber") as of January 2017. I understand that Waymo has filed a lawsuit against Uber, Ottomotto LLC ("Otto") and Otto Trucking LLC in the U.S. District Court for the Northern District of California. I submit this declaration in support of Defendants' Motion for Summary Judgment of Non-infringement. I have personal knowledge of the facts set forth in this declaration and, if called to testify as a witness, could and would do so competently.

2. I joined Otto in May 2016 as Senior Mechanical Engineer and LiDAR lead, after Otto completed its acquisition of Tyto LIDAR LLC ("Tyto"). I was tasked with leading the team at Otto in developing a light detecting and ranging (LiDAR) solution for autonomous trucks. Uber acquired Otto in August 2016, and since that time, I have been responsible for the technical development of Uber's LiDAR sensors.

Fuji Design

3. Fuji has two optical cavities, each with 32 channels oriented at different vertical angles to capture the field of view necessary for applications in self-driving vehicles. The "medium-range cavity" is tilted downwards in order to see the ground and any obstacles immediately in front of a vehicle. The "long-range cavity" sees obstacles up to the full detection range. Each cavity has separate receive and transmit lenses.

4. Figure 1, below, is a true and correct annotated CAD drawing of a cross-sectional top view of the Fuji design. As illustrated in Figure 1, light is emitted from diodes on the transmit block and travels to the transmit lens along the transmit path (shaded in red). Reflected light is collected and focused by the receive lens, and this light travels to the receive board along the receive path (shaded in purple).

[redacted]

5. Each cavity comprises two separate compartments—a narrower compartment for the transmit path and a wider compartment for the receive path. A metal separation optically separates the transmit path and the receive path, so that within each cavity the transmit path and the receive path do not overlap. This metal separation prevents interference between the emitted light and the target-reflected light within the receive compartment. Care is taken to ensure that the light emitted from the transmit path does not enter the receive path until after it exits the transmit lens and is reflected from a target. Moreover, the transmit path has a separate lens from

the receive path. The narrower lens is for the transmit path, and the wider lens is for the receive path. Fuji does not use a single lens for transmitting and receiving light.

Spider Project

6. I joined Otto in May 2016 as Senior Mechanical Engineer and LiDAR lead, after Otto completed its acquisition of Tyto LIDAR LLC ("Tyto"). I was tasked with leading the team at Otto in developing a light detecting and ranging (LiDAR) solution for autonomous trucks. Shortly after I joined Otto, my team began working on a fiber-based LiDAR project intended for autonomous trucks. This project was known as the "Spider" project. The Spider project sought to leverage a pre-existing LiDAR sensor (known as "Owl") that had been developed at Tyto beginning in 2012. Tyto's Owl device was a mapping LiDAR sensor that used a single fiber laser. The Spider project was never completed and my team abandoned the Spider project to work on a very different LiDAR design, Fuji, in late October 2016. Prior to abandoning the Spider project, we built a few components for testing purposes, but we never completely assembled these parts, and we never built all of the components needed for functional prototype, much less a complete LiDAR device. Thus, Spider was never made, used, sold, offered for sale, or imported, and there are no plans to revive the abandoned Spider project.

7. The design concept for the Spider project was a LiDAR sensor with eight optical cavities, eight fiber lasers having a wavelength of approximately 1550 nanometers, and sixteen optical lenses (with each optical cavity having two optical lenses). Each optical cavity had two optical lenses, where the two lenses work together to provide collimation of the light emitted from the transmit fibers into the environment and to focus the target-reflected light to the detectors.

8. The Spider design included eight fiber lasers, each of which was split into eight "transmit fibers" to create a total of 64 transmit channels. Each cavity had eight transmit fibers—a single transmit fiber from each of the eight fiber lasers. Spider did not use any printed circuit boards (PCB) for positioning transmit fibers within a cavity. Rather, the transmit fibers were mounted into ceramic sleeves or ferrules which were bonded into holes drilled through a metal plate.

9. Figure 2A and 2B, below, are true and correct computer aided design (CAD) drawings of the Spider design. Figure 2A shows a perspective view of the design, and Figure 2B shows a top view of the design:

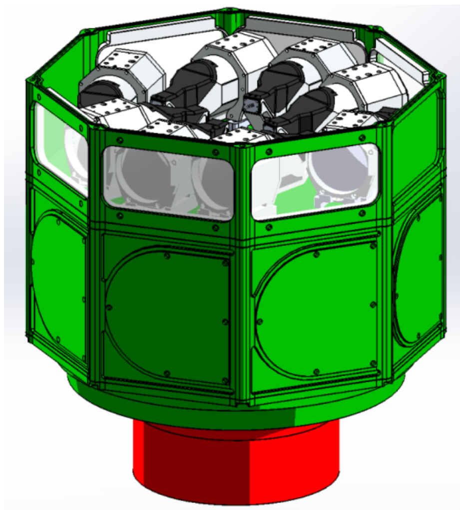

Figure 2.A

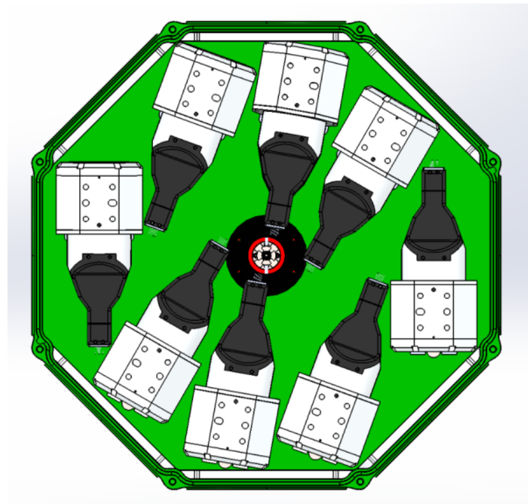

Figure 2.B

10. Although Spider was intended to have eight optical cavities, our team only built a single optical cavity for testing purposes before the Spider project was abandoned. Figure 3.A, below is a true and correct photo of the test Spider optical cavity. Figure 3.B, below, is a true and correct annotated CAD drawing of a cross-sectional side view of an optical cavity design for Spider.

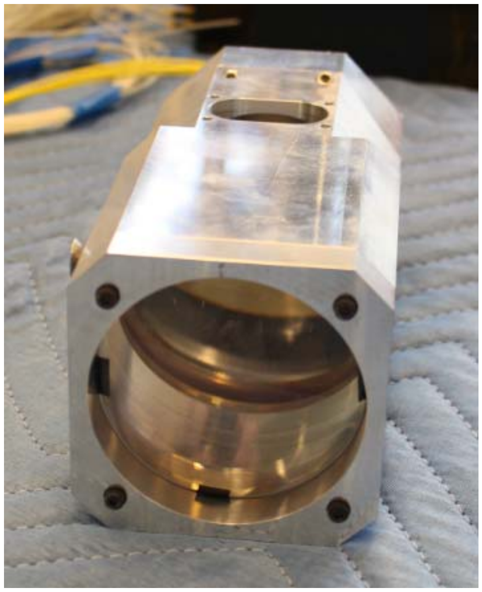

Figure 3.A

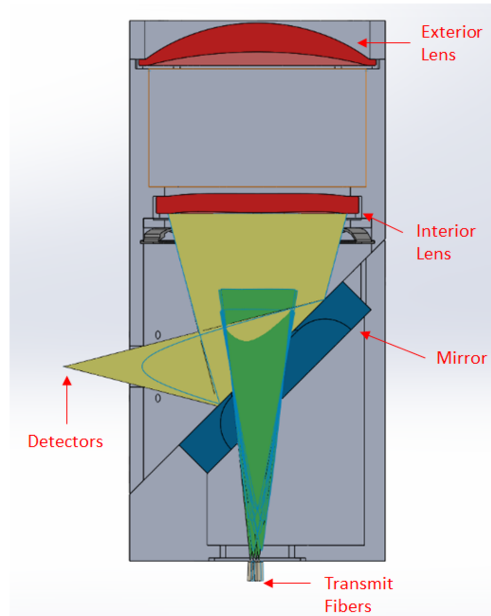

Figure 3.B

11. As mentioned above, we abandoned the Spider project before we completed a prototype device. Spider was designed to have eight optical cavities, but we had only built one optical cavity for testing purposes, and never mounted that single test optical cavity onto the rotating base. For the one test optical cavity that we built, we were unable to place the transmit fibers accurately enough to align the eight transmit fibers to the eight photodetectors.

12. My team worked on the Spider project until late October 2016. Spider proved to be undesirable and was abandoned because of the complexities of the design, the anticipated difficulty of scaling the manufacturing of the design, and its large size, heavy weight, and high power requirement. As designed, Spider would likely have weighed approximately 165 pounds, which would have been about six times heavier than a Velodyne HDL-64. While the large size and heavy weight of the Spider design was less of a consideration for a semi-truck, the weight of Spider design, along with the additional components that would have been required to mount a completed Spider onto the roof of a passenger vehicle, would have likely exceeded the rated payload of the roof of a Volvo XC90 (220 pounds).

13. The LiDAR team's decision to abandon Spider and pivot to Fuji was made by the engineering team and was based on design considerations. When I met Scott Boehmke and Eric Meyhofer in October 2016 to discuss my team's work on Spider, we concluded that the Spider design would be undesirable for use in Uber's vehicles because of the reasons explained above (i.e., the complexity of the design, anticipated difficulty with scaling, and its large size, heavy weight, and high power requirement).

Inspection of Spider Components

14. On Friday, April 14, 2017 and Monday, April 17, 2017, I oversaw the collection of existing components associated with the abandoned Spider project for Waymo's inspection on Wednesday, April 19, 2017. Esther Kim Chang of Morrison Foerster and Aaron Bergstrom of Uber assisted in this process.

15. In gathering the parts for inspection, I found the majority of the mechanical components associated with the Spider project in a storage locker on the ground floor of Otto's former offices at 737 Harrison Street.

16. We found eight fiber lasers and connected fiber optic splitters as well as electrical components associated with the Spider project under a tarp in the basement of 737 Harrison Street.

17. We found the one optical cavity for testing purposes associated with the Spider project in a plastic bin near the storage locker on the ground floor of Otto's former offices at 737 Harrison Street.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed this on 2nd day of May, 2017, in San Francisco, California.

James Haslim